

## Self-supporting basins and reservoirs made of plastic or similar material.

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Thin-walled, non-rigid basins or reservoirs fabricated in plastic material, in rubber or a similar material, and supported by an appropriate structure are already known; for example, a basin or reservoir made of non-rigid material can be encased in a cavity with the appropriate dimensions in which the non-rigid material takes on the form of the wall, and which supports practically all the thrust of pressure of the liquid of the basin or reservoir, with the rigid material playing practically no role other than that of a water-tight lining.

Due to the need for structural support, such basins or reservoirs involve a long and complicated setup, and the costs of their installation are considerable.

The invention proposes the realization of a basin or reservoir in flexible plastic material or similar material resting on the ground and not requiring any support structure (self-supporting), with the form preferably taking shape progressively as the filling takes place.

More precisely, the invention concerns a self-supporting basin or reservoir resting on the ground, made of a flexible, resistant and water-tight liner, characterized in that the vertical components of the pressure of the liquid that it contains upon the shell walls come into equilibrium with one-another thereby ensuring the stability of the filled basin or reservoir, while the horizontal components take the shape of circles produced by two peripheral reinforcement components that are practically non-deformable, positioned respectively at the base and at the summit of the basin or reservoir.

Preferably but not necessarily, the basin or reservoir has a circular or oval form. It can be produced, for example, in thin, resistant plastic material that is not subject to physico-chemical reactions with the filling liquid. For example, for a reservoir or basin designed to contain water, "styrene" could be used advantageously.

The reinforcement components are preferably stainless steel cable.

Finally, the invention concerns an attached device ensuring suppression at the summit of the flexible shell basins or reservoirs, consisting essentially of a floater or rigid vertical peripheral component mounted on the opening of the basin or reservoir. In particular, this device is very advantageously employed with basins or reservoirs according to the invention.

The description that will follow and the attached drawings, provided primarily by way of example, will allow a better understanding of how the invention can be realized. Reference will be made to the attached drawings wherein:

Figure 1 is a partial schematic view vertical axial section of a circular basin or reservoir according to the invention;

Figure 2 is a view from above of an oval basin or reservoir according to the invention;

Figure 3 is a vertical schematic section view of a basin according to the invention covered with a canopy.

The basin or reservoir represented in figure 1 consists essentially of a thin resistant and water-tight liner 1, for example in an appropriate plastic material such as tergal or styrene, the liner itself being water-tight or coated with a water-proof coating. The basin rests at its base 2 on a surface 3. It has the form represented, being a revolution about the axis 4. In a characteristic manner, it is equipped at its base 2 with a peripheral circular stainless steel cable 5, and at the periphery of its upper opening, a similar cable 6. Cables 5 and 6 are attached to the liner 1 by any appropriate means. For example, they are housed in an edging 7 and 8 welded to the liner 1. The liner itself can be made in the form of a series of meridian bands assembled (for example by sewing) and

welded, which enables the practical realization of a surface of revolution.

Finally, adjacent to cable 6, a circular floater 9 is mounted on the periphery of the opening of the basin. This floater is advantageously an inflatable 'sausage' enclosed in the interior, and inflated with air (or a vertical annular shell ensuring an over-arch).

The implementation of the device thus realized (filling) is as follows: with the liner 1 resting with its base 2 on the ground, and the floater 9 resting on this base (empty basin), the filling liquid is introduced via the basin opening. As the filling progresses, the floater 9 begins to float and rises by remaining above the level of the liquid, which avoids any possibility of overflow. At the same time, due to the effect of the liquid pressure, there is a progressive adaptation of form by the liner 1, which tends to occupy the position shown in figure 1 (filling).

It can be noted that a filling floater of type 9 can be used not only for the filling of basins or reservoirs according to the invention, but also for the filling of basins or reservoirs of any type fabricated using a flexible liner which only takes its definitive form after filling. It can also be noted that a basin or reservoir according to the invention could, in summary, be formed prior to filling by means of a support system maintaining the liner at its defined level, even though the use of a floater according to the invention is much more advantageous.

Characteristically, the distribution of the effects of the thrust or buoyancy of the liquid on the shell 1 of a basin or reservoir according to the invention when it is full occurs in the following manner:

The horizontal components of the thrust of the liquid on the lateral shell of the basin or reservoir are taken up in circles by the two cables 5 and 6;

The vertical components of the thrust on the wall of the basin or reservoir according to the invention are in equilibrium with one another, while assuring the stability of the basin or reservoir whose shape they produce.

The basin or reservoir according to the invention is thus in perfect equilibrium without any support structure.

In addition, with cables 5 and 6, being of a practically invariable diameter, the base 2 (of the reservoir) is not subjected to any stress, which means that certain surface irregularities 3 can be absorbed, and in particular, before filling, it is not necessary to carry out a careful preparation of surface 3, with a simple smoothing of this surface being sufficient.

Figure 2 represents an overhead view of another mode of realization of the invention. The only difference with the mode of realization in figure 1 is

in the fact that the basin or reservoir here is of oval form. To create this, the cables placed at the base or at the summit (for example upper cable 10) are attached to two poles 11 and 12 planted in the ground, which means that under the effect of the thrust or buoyancy of the water they take on an oval equilibrium form (4 arcs of circles).

Figure 3 represents schematically another mode of realization of the invention. This mode of realization is characterized by the fact that the peripheral floater 20, as well as a central attached floater 21 serve as support elements for a roof similar to a tent.

In another method of realization of a basin or reservoir, an envelope can be used which conforms to that which was described, with the assumption of form occurring by filling, and the coating of the exterior surface of the envelope with a rigid and resistant coating, cement or resin, for example.

#### SUMMARY

The invention concerns notably:

1° A basin or reservoir created by the pressure of a liquid which it contains and resting on the ground, realized in a flexible, resistant and watertight liner, characterized in that the vertical components of the pressure of the liquid which it contains on the lateral walls are in equilibrium with one another, ensuring the stability of the filled basin or reservoir, while the horizontal components are taken up in circles by two practically non-deformable peripheral reinforcement components placed respectively at the base and the summit of the basin or reservoir;

2° Methods of realization of the device according to 1° presenting the following specifics taken separately or in combination:

- a. The reinforcing components are cables;
- b. The cables are made of stainless steel;
- c. The flexible liner is made of styrene;
- d. The cables are mounted in an edging welded to the liner;
- e. The basin or reservoir is circular;
- f. The basin or reservoir is oval;
- g. All sections of the basin are realizable on the basis of the elements of circles;
- h. A peripheral "floater" is mounted on the upper part of the liner;

3° For the filling of flexible liner basins or reservoirs, and in particular basins or reservoirs according to 1° and 2°, the use of a floater attached to the upper periphery of the liner.

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